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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/379,439	08/23/1999	RAYMOND D. MCINTYRE	10070-1003	1268

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PATENT DEPARTMENT
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EXAMINER	
SONG, HOON K	

ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 12/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/379,439	MCINTYRE ET AL.	
	Examin r	Art Unit	
	Hoon Song	2882	

-- Th MAILING DATE of this communication appears on the cover sheet with th correspond nce address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 August 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-54* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *31-40,46 and 53* is/are allowed.

6)☐ Claim(s) *1-4,7-11,13-30,41,44,45,47-49,51,52 and 54* is/are rejected.

7)☐ Claim(s) *5,6,12,20,42,43 and 50* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 August 1999* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Objections

Claim 20 is objected to because of the following informalities: Claim 20 recites the limitation "said x-ray conversion" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 7-11, 13, 21-30, 41, 44, 47-49, 51-52, 54 are rejected under 35 U.S.C. 102(b) as being anticipated by Lidsky et al. (US 5784423).

Regarding claim 1, Lidsky teaches a target irradiation system (5) comprising:

an x-ray source (14) operable to emit x-rays (20);

a target object (38, 40, 42) capable of becoming radioactive upon receiving the emitted x-rays;

a relative positioning apparatus (48) operable to translate the target object relative to the x-rays.

Regarding claim 2, Lidsky teaches that said x-ray source includes an industrial linear accelerator (16) having an x-ray generating target (14).

Regarding claim 3, Lidsky teaches that said x-ray source includes means for emitting an x-ray beam including said x-rays and said system further comprising a means for shaping (collimator) said x-ray beam.

Regarding claim 7, Lidsky teaches that said relative positioning apparatus includes a tube assembly having:

a stationary member (100) defining an interior path for receiving the target object (38, 40, 42); and a translation assembly (48) for moving the target object along a path within said stationary member, said path positioned such that the target object receives said x-rays emitted from said x-ray source (figure 5).

Regarding claim 8, Lidsky teaches that said stationary member defining an interior path is a tube (46a, 44a, figure 5).

Regarding claim 9, Lidsky teaches that said tube assembly further comprises a heat transfer (79) apparatus supplying a heat transfer fluid within the interior of said stationary member defining an interior path (column 2 line 10+).

Regarding claim 10, Lidsky teaches that said translation assembly includes linear and rotational translation apparatus (figure 5).

Regarding claim 11, Lidsky teaches that a plurality of members each defining an interior path and having an associated translation assembly for moving at least one target object along said interior path within each said member defining an interior path, each said interior path positioned to be impinged upon by said x-rays emitted form said x-ray source (figure 5).

Regarding claims 13 and 30, Lidsky teaches that said relative positioning apparatus includes a tube assembly having:

A substantially stationary tube defining an internal target object conduit path and a translation assembly for moving the target object within said stationary tube along a desired path positioned to be impinged upon by said x-rays emitted from said x-ray source (figure 5).

Regarding claim 21, Lidsky teaches that said relative positioning apparatus includes a fixed positioning member (50) retaining at least one target object (38) in generally fixed relation to said x-ray source while positioned in the path of said x-rays (figure 5).

Regarding claim 22, Lidsky teaches that an electron beam directing apparatus between the electron beam source and an x-ray conversion target (figure 5).

Regarding claim 23, Lidsky teaches that said electron beam directing apparatus includes a magnetic means for directing the electron beam (figure 5).

Regarding claim 24, Lidsky teaches that a heat transfer system conduction heat away from an x-ray conversion target (figure 3).

Regarding claim 25, Lidsky teaches that said heat transfer system includes a conduit (79) for conveying a heat transfer fluid (figure 3).

Regarding claim 26, Lidsky teaches that a thermal shield between an x-ray conversion target and at least one target object positioned on said relative positioning apparatus (figure 3).

Regarding claim 28, Lidsky teaches that a thermal shield between said x-ray conversion target and said relative positioning apparatus (figure 3).

Regarding claim 29, Lidsky teaches a chamber (50) downstream of the x-ray source, said chamber including a target object entry port and wherein said relative positioning apparatus includes a translation armature (48) extendable through said target object entry port.

Regarding claim 41, Lidsky teaches that a target irradiating system comprising:

An electron beam source providing a beam of electrons;

A positioning assembly including a linear movable translation armature (48) said translation armature mounted to said positioning assembly at least for linear motion in an axial direction and said translation armature including a mounting apparatus mounting at least one target object;

An x-ray conversion target mounted on said translation armature between said translation armature and said election beam source wherein said x-ray conversion target defines a radial access region providing access to said at least one target object and said x-ray conversion target includes an x-ray generating martial activated by said beam of electron s to emit x-ray and

Target object capable of becoming radioactive upon receiving the emitted x-ray (figure 5)

Regarding claim 44, Lidsky teaches that said x-ray conversion target is substantially plannar.

Regarding claims 47 and 51, Lidsky teaches a target irradiation system comprising:

an electron beam source providing a beam of electrons (18) ;

an x-ray conversion target (14) in fixed relation to the electron beam source in the path of the beam of electrons from the electron beam source, the x-ray conversion target including an x-ray generating material activated by the beam of electrons to emit said x-rays;

a target object (38) capable of becoming radioactive upon receiving the emitted x-rays;

an electron beam directing apparatus (collimator) between the electron beam source and the x-ray conversion target; and

a retaining apparatus (50) retaining the target object in relation to said electron beam source.

Regarding claim 48, Lidsky teaches a target irradiation system comprising:

an x-ray source means for generating x-rays (14); and

a positioning means for positioning at least one target object (38), in the path of said x-rays generated by said x-ray source means (14), including means for moving (48) at least one target object in relation to said x-rays generated by said x-ray source means; and

a target object (38) capable of becoming radioactive upon receiving the generated x-rays.

Regarding claim 49, Lidsky teaches that said x-ray source comprises:

an electron beam (18) source means providing a beam of electrons;

an x-ray conversion target (14) means in fixed relation to the electron beam source in the path of the beam of electrons from the electron beam source, the x-ray conversion target including an x-ray generating material means for emitting x-rays when activated by said beam of electrons (figure 5).

Regarding claim 52, Lidsky teaches a method of irradiating a target object comprising:

providing a beam of electrons (18);

positioning an x-ray conversion target (14) in fixed relation to said beam of electrons and impinging upon and receiving said beam of electrons;

emitting x-rays from the x-ray conversion target when activated by said beam of electrons;

selecting a target object (38) capable of becoming radioactive upon receiving the emitted x-rays;

moving (48) at least one of target object in relation to said x-ray conversion target and in the path of the x-rays emitted by said x-ray conversion target.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 4, 14-20 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lidsky et al..

Regarding claim 4, Lidsky fails to teach that the target comprises an implantable medial object.

It would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to use the target material as implantable such as stent since Lidsky teach that the target can be used as medial or industrial radiation source of intense neutron radiation (column 3 line 5+).

Regarding claims 14-20, Lidsky fails to teach a parameter measuring sensor and control circuit but one would be motivated to adopt the sensor and control circuit in order to properly operate the apparatus.

Regarding claim 45, Lidsky fails teach that said x-ray conversion target has an arcuate cross section shape but one would be motivated to change the shape of the conversion target in order to concentrate x-ray beam.

Allowable Subject Matter

Claims 31-40, 46 and 53 are allowed over prior art.

Claims 5-6, 12, 42-43 and 50 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claims 5-6, 31-40 and 53, Lidsky fails to teach that said relative positioning system includes a rotatable carousel at least a portion of which is impinged upon by and receives at least a portion of said x-rays, said rotatable carousel including

at least one target mount for retaining at least one target object in fixed relation to said rotatable carousel.

Regarding claim 12, Lidsky fails to teach the stationary member defining an interior path includes an x-ray source activated by said beam of elections to emit x-rays.

Regarding claim 42, Lidsky fails to teach that said positioning assembly includes a means for moving said x-ray conversion target mounted on said translation armature between a first position range impinged upon by said electron beam, and a second x-ray conversion target position not impinged upon by said electron beam; and said positioning assembly includes a means for moving said at least one target object mounted on said mounting apparatus between a first target object position range corresponding to said first x-ray conversion target position range at which said at least one target object is positioned in the path of x-rays emitted by said x-ray conversion target and a second target object position not impinged upon by said electron beam.

Regarding claim 43, Lidsky fails to teach that an irradiation enclosure defining an interior space wherein said first x-ray conversion target position and said first target object position are within the interior space defined by said irradiation enclosure and said second x-ray conversion target position and said second target object position are outside said irradiation enclosure.

Response to Arguments

Applicant's arguments with respect to claims 1-54 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoon Song whose telephone number is 703-308-2736. The examiner can normally be reached on 8:30 AM - 5 PM, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Glick can be reached on 703-308-4858. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

David Bruce

DAVID V. BRUCE
PRIMARY EXAMINER

Hoon Song HS